

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing

(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2005/001130

International filing date (day/month/year)
18.03.2005

Priority date (day/month/year)
18.03.2004

International Patent Classification (IPC) or both national classification and IPC
C07C227/08, C07C209/10, C07C213/02, C07D207/32, C07D209/08, C07C311/08, C07D215/60, C07C229/60,

Applicant
CAMBRIDGE UNIVERSITY TECHNICAL SERVICES LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2005/001130

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/GB2005/001130

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-13
	No: Claims	-
Inventive step (IS)	Yes: Claims	1-13
	No: Claims	-
Industrial applicability (IA)	Yes: Claims	1-13
	No: Claims	-

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43bis.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43bis.1 and 70.9)

see form 210

**WRITTEN OPINION OF THE
 INTERNATIONAL SEARCHING
 AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/GB2005/001130

Item V.

D1: US-A-5 576 460

D2: FUERSTNER, ALOIS ET AL: JOURNAL OF THE AMERICAN CHEMICAL SOCIETY,
 123(37), 9000-9006 CODEN: JACSAT; ISSN: 0002-7863, 2001, XP002331227

Document D1, which is considered to represent the most relevant state of the art, discloses a method of aminating an aromatic group by transition-metal catalyzed cross-coupling reaction from which the subject-matter of present claim 1 differs in that the solvent is compressed carbon dioxide and in that a silylamine is used as a starting material.

Accordingly, the subject matter of claim 1 (and dependent claims 2-13) is new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as the provision of a further method of aminating an aromatic group.

The replacement of the usual organic solvent of D1 with compressed carbon dioxide is an unobvious measure because the skilled person would expect that an amine starting material would react with carbon dioxide, leading to carbamate formation (cf. also D2, Figure 3). He would not expect, with a clear anticipation of success, that the silylamine (which is not reactive towards the carbon dioxide) could be used as a starting material that enables transition-metal catalyzed cross-coupling reaction to be performed with good success in compressed carbon dioxide.

Accordingly, the subject matter of claim 1 (and dependent claims 2-13) is considered as involving an inventive step (Article 33(3) PCT).

Aromatic amines are pharmaceutical intermediates and active ingredients in drugs.

Accordingly, the subject-matter of claims 1-13 is considered as industrially applicable.